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ABSTRACT

The internet has been considered the world's largest experiment in chaos. This paper presents a look at Internet applications and some considerations for preparing materials for utilizing these applications. The goal of the paper is to help bring order to the chaos and allow preparation of materials for Internet distribution by informing about the tools and resources used by the Internet community. Discussions include historical perspective, methods of accessing information on the Internet, publishing and distributing files on the Internet, and grades of Internet service. Software applications for retrieving Internet information include: Telnet, FTP, Electronic Mail (e-mail), Network News, Gopher, and World Wide Web. Also discussed are sending e-mail through a reflector; listserves; setting up a server; and finding resources using the search tools Archie, Jughead, and Veronica. A table of suffixes used for converter and compression programs is included. (MKR)

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Internet Publishing an Introduction and Discussion of Basics

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INTRODUCTION

The Internet has been considered the world's largest experiment in chaos. Many have "surfed" the Internet and found wonderful resources far beyond the dreams of even the science fiction writers of just a few years ago. This paper presents a look at Internet applications and some considerations for preparing materials for utilizing these applications. The goal of the paper is to help bring order to the chaos and allow preparation of materials for Internet distribution by informing about the tools and resources used by the Internet community.

HISTORICAL PERSPECTIVE

The Internet is the world's largest computer network. A typical local area network (LAN) in an office or school may connect 2-20 computers, imagine expanding that network to hundreds of thousands of computers. Now a vision of the size of the Internet can be established. Multiple people using workstations on your LAN, imagine expanding that to millions of users. While this model is limited it begins a process for envisioning the massiveness of the Internet.

An information revolution has already happened in this country. Many will say that we are in an information age. Many will also say we have passed the Information Age and are now in an Information Search and Retrieval Age. In both cases, the Internet has played and will continue to play a large role in the storage, search, and retrieval of information.

Where did the Internet come from?

About 20 years ago, the U.S. Department of Defense needed a method for linking sites at various locations around the world. This network was known as ARPAnet. The goal of ARPAnet was to build a network that could withstand bombing attacks. Until then, when a user of a computer wanted to send information to another computer, there had to be a physical link or direct connection between the computers. ARPAnet used a model which is very similar to the one used by the current Internet which required only a little processing of the information by the client computer and the network would take care of routing the information to the appropriate machine.

Fundamentally, the model is very similar to the postal service (but usually is faster and more reliable). The client computer will take a batch of information, called a packet, and put it in an envelope and put an address on the envelope. The addresses are called IP addresses. The two computers were also to make sure the transmission got through correctly since this was not a function of the network.

The ARPAnet banded with several other regional and educational networks to later form what we now commonly call the Internet. While the services offered by every network are not the same, there are several basic services of the Internet which have been translated to all these networks to become the common services available on the Internet. The Internet as we know it today can be described as a network of networks.

METHODS OF ACCESSING INFORMATION ON THE INTERNET

There is plenty of information available on the Internet. But the information wouldn't do any good if there wasn't any method for accessing it. In publishing information for the Internet it is good to know

what types of software people will be using to access the information once it is available to the Internet. One of the great things about the Internet community and the software developers that keep it thriving is that when a need exists that software can fix, it usually is written. On a recent piece of Internet software, the title screen where it presents the version number it contains a phrase that kind of sums things up well "Changing as quickly as time..."

Applications for the Internet

Over the years, several applications have served the Internet community. Some are quite old but still in use while others are relatively new and still being explored and developed. The following is a non-exhaustive list of software tools for the Internet:

- Telnet
- File Transfer Protocol (FTP)
- Electronic Mail (e-mail)
- Network News
- Gopher
- World Wide Web (WWW)

Through e-mail, a request can be made for a document that offers a more complete explanation of the Internet tools than are available in this short paper. To request the document, send e-mail to "LISTSERV@EARNCC.EARN.NET" leave the subject field blank and enter the following single line in the body of the message "GET NETTOOLS.PS" for a postscript version or "GET NETTOOLS.TXT" for the ASCII text version of the file.

A brief explanation of these software applications is offered in the following paragraphs. An understanding of the types of applications is useful in determining how and what method to use in publishing your information.

Telnet. The software application that allows a user on one computer to connect to another computer and log into that computer with a username and password or some type of access. Here's an example of when a user might want to use telnet. Say a user is at a regional office in Toledo, Ohio and the name of their computer is mudhens.toledo.org. The user has logged into that system. The users home office is located in Cleveland, Ohio. The user wants to access software and files at the home computer which is named: browns.cleveland.org. From the "mudhens" computer the user could enter a command like "telnet browns.cleveland.org" and the network allows the user to log into your system just as if they were in the home office.

For publishing information on the Internet, telnet would only serve to get Internet clients to where information is located and then the client would run some other type of software to view the information.

FTP. The software application that allows users to move files from one computer on the Internet to another. Using the same example as with telnet, suppose a user at a regional office in Toledo logged in from Tony Paco's and needed to get a sales report file from a computer in Cleveland. The user might enter a command such as "ftp browns.cleveland.org" which would then allow the user to log into the computer for file transfer commands. To retrieve a file, the user might enter the command "get season-tickets.txt" and the file would be sent from the computer in Cleveland to the computer in Toledo.

For publishing information, ftp is considered old access, but is still used extensively for storing files which have been formatted with PC type software such as Microsoft Word, or Word Perfect. More on how to do this later.

Electronic Mail. The software application that allows users on the Internet to send information (usually text) to another Internet user. Electronic mail does not require that the two computers be turned on at the same time. This makes e-mail the ideal communications medium for getting information to people all over the world. Suppose a scout for the Cleveland Browns heard about a player who played for the World League in Frankfurt, Germany. The scout might send an e-mail message to coach@galaxy.frankfurt.germany from Tony Paco's at 8:00 in the morning in Toledo through the computer in Cleveland and when the coach of the Frankfurt Galaxy checked e-mail 7 hours later after arriving at work, the message would be waiting.

For publishing information, e-mail provides a couple a extended features like listserves and mail-lists which allow one person on the list to send information to a large number of people without having to know or remember all of their electronic mail addresses. Formatting for an electronic mail message is much the same as gopher (explained later) unless you use the Multipurpose Internet Mail Extensions (MIME) developed by Bellcore Labs. Basically, it allows you to send formatted files like Microsoft Word, Word Perfect, or even movies, and sound along with your message text which can then be heard, viewed, or loaded on the receiver's end of the process.

Network News. Network News is basically an interactive newspaper. Topics are grouped together in "newsgroups" and internet users who are interested in those topics can view the article posted and respond to them. A response to a posted article is sometimes called a threaded message.

For publishing information, network news is good for informal information and information that isn't necessarily going to be kept around for a long time. Opinions about certain topics might be expressed and debated in newsgroups before a final paper or presentation is put together. A common use for network newsgroups is to seek other Internet users opinions about a topic before formulating a formal paper or purchasing software.

Gopher. The Internet Gopher is a navigating tool that takes many of the features of the Internet and puts them into one handy little package. Things such as ftp and telnet are made easier with a menuing structure presented by a gopher program called a client application. Gopher was developed by the University of Minnesota (home of the golden gophers) so they had the privilege of naming the software. Gopher was designed to be a rudimentary kiosk information server. Departments on campus could store information on a local computer, but the information would be available campus wide on terminals where "no training" was required to use the machines. It didn't take long for the Internet community to decide that if it could be done on one campus it could be expanded world wide. With well over 4800 gopher servers around the world, it did work beyond the campus limit.

For publishing information, gopher is probably the easiest to prepare for and set up. A section on things to consider when preparing information for gopher is later in this paper.

World Wide Web. The World Wide Web is a hypermedia system that was originally designed to share information between physicists. The WWW combines multimedia capabilities into a browsing atmosphere with links to text, pictures, and sounds located on computers all around the world. WWW introduced, or at least utilized extensively, uniform resource locators (URLs).

For publishing information that includes graphics or text formatting, the WWW offers some exciting features. It requires a pretty fast connection (usually 9600 baud or higher) to the Internet to effectively use features like displaying graphics, downloading sound, and displaying animated movies. Therein lies the tradeoff between gopher and WWW in publishing information.

What if a file isn't just text?

Files you have that only contain plain text without bolds, underlines, italics, or other formatting serve many purposes. However, they do not always meet your needs when trying to send things to other people through the Internet. Say you have spent a great deal of time working on a graphic in Aldus FreeHand or Adobe Photoshop and then add that graphic to a desktop publishing file like those from Aldus PageMaker. The file on your end looks great. If the person on the other end can only see the text it has lost its effect. So, the Internet must have a method for transferring information that is more than just text.

As a publisher of information or files on the Internet, there are certain utility programs which a degree of familiarity is useful. Friendly publishing on the Internet includes letting the end-user know a little about the file's type by the name you give it. This is done through suffixes to the file name. On FTP, Gopher, and WWW sites where file names are listed for you to download common suffixes should be applied fairly universally around the Internet. When you look at a filename you should be able to determine what types of conversion programs are needed to restore the original file. For example, a DOS user might look at a file named "cool.wp.zip.uu" and they would know to use UUDecode, then PKUnZip, and then Word Perfect to view the file. See table 1 for a list of suffixes used for converter and compression programs.

PUBLISHING AND DISTRIBUTING FILES ON THE INTERNET

This portion of the paper pertains to publishing by e-mail, ftp, Gopher, and WWW and highlights some of the possibilities available. Where appropriate, a list of resources or locations where software or files exist to assist in publishing are provided. Examples of markup languages applies to the WWW section only and sections about WWW publishing will detail those.

Publishing information by e-mail

Publishing information by electronic mail is probably the easiest and cheapest method to get information to people on the Internet. If a limited number of people need to get specific information, then e-mail might be very effective. Electronic mail publishing has basically three options. First, a personal message can be sent to each person on a distribution list. For a large group, this option would become very time intensive. Second, a mail reflector could be established which is an e-mail address where things get sent and then automatically sent to everyone on the list. For a reflector, there are no commands available to members of the list, everything sent to the list is sent to everyone on the list. The third option is the most sophisticated for e-mail and is called listserves. With the listserve option, people who are interested in the information topic subscribe to a list through an automated software package called

listserve software. An owner of the listserve then has some management control over what gets on the list and who can get on it. There are a lot of options available with listserve software. To find out some commands available with listserve software send an e-mail to "LISTSERV@SUVM.SYR.EDU". Leave the subject field blank. In the body of the message type a single line "REFCARD" and an e-mail message will be returned to you that lists commands available to listserve subscribers.

Electronic mail can contain multimedia information as well as text. Bellcore Labs developed the MIME standards which allow Internet mailing programs to send things other than text. For some things they have integrated BinHex and UUEncode schemes. But MIME isn't limited to just that. There is a method for adding types of information sent via MIME. New descriptions could come out at any time.

Sending personal e-mail. E-mail compared to regular mail has two obvious advantages. The first advantage is speed. E-mail can reach another user within hours or minutes of the time you send it. The second advantage is convenience. You can send e-mail 24 hours a day and the people you send messages to can receive them 24 hours a day. No more responses like, they just left for the day when you try to telephone someone. To send a message to another user on the Internet all you need to know is their electronic mail address. A simple example of an e-mail address would be: clinger@mudhens.toledo.org. The e-mail address tells the computer who and where to deliver the message to. To read this e-mail address, you would say, "clinger at toledo dot mudhens dot org." The Internet has a series of gateways that connects over 5000 networks and interprets the computer name and knows where to send the message.

Depending on mail software sending e-mail to a group of people with different electronic mail addresses can be aided with a function called nicknames or aliases. Applications implement the feature differently, but the function is to have the ability to set up a short name which has one ore more e-mail addresses associated with it. So, an alias or nickname called "staff" could contain the e-mail addresses of the entire staff so e-mail could be sent to the staff without having to remember each person or type their addresses each time you want to send something. Likewise, group of people who have requested an e-mail newsletter might have an alias and each time a newsletter is produced it is sent to the alias which goes to 1 or 20 people with the same amount of time.

Sending e-mail through a mail reflector. A mail reflector is one step beyond aliases. A mail reflector is a separate e-mail address that people can send e-mail to. When the mail software receives a message to a reflector it automatically sends the message to everyone who is on the reflector list. Each e-mail address listed in the reflector list receives the message. This includes the sender if their e-mail address is on the list.

Typically, setting up a mail reflector requires contacting a system administrator and requesting one. They will set up the reflector's list file which the manager of the reflector controls what names get added or removed from the list. The mail reflector option works well for those who don't want the overhead of setting up and maintaining a listserve. While the number of names that appear on a reflector's list isn't limited, it works well for lists up to about 100 names. Larger sets of e-mail addresses are probably better handled through listserve software.

Publishing with listserves. Listserves are very popular. There are a lot of topics which have listserves which allow the free flow of information via electronic mail. Once a listserve is set up, most of

the maintenance of the list is handled by the subscriber to the list. To subscribe to a list, the person sends an e-mail message to the listserve software with the command SUBSCRIBE. The list of names to receive messages is automatically updated. If a person wishes to leave a list, they send an e-mail message to the list with the command UNSUBSCRIBE.

Probably the biggest advantage of listserves is that the automation of certain tasks makes it easy to send information to a large number of people. It also has the convenience of being able to announce the service is available and letting those who are interested in the topic subscribe to it automatically saving a burden of human resources on your end. A disadvantage would be that someone has to look at the owner's error reports which get sent to them by the listserve software. For lists of over 100 people, this is a very convenient method of sending information over e-mail.

Software available. For many users, the software for e-mail is determined by their Internet provider. For example, America Online requires use of their software to access their services. Users with dial-up UNIX accounts may have one or two choices for a mailing program. A direct connection or a simulated direct connection such as (Serial Line Internet Protocol) SLIP connection allows the option of using POP mail software. There are some freeware and commercial POP mail programs. A popular freeware POP mail program is Eudora which is available for Mac and Windows. POP mail programs make sending and receiving e-mail very convenient. You can request copies of the Macintosh version of Eudora by sending e-mail to "majordomo@qualcomm.com" in the body of the message type "get freeware Mac/Eudora.hqx" and the file will be sent to you as a BinHex file. Did you notice the ".hqx" suffix at the end of the filename?

Compatibility. Some older mail programs do not have the ability to do automatic word wrapping. So, if you are preparing something like an electronic newsletter that will be simply ASCII text, it is best to format the text so that it is 70-75 characters on a line and press <return> or <enter> for each line. Sometimes this is called saving with line breaks. Sending multimedia mail requires the recipient to have a capable mail program to convert the information back into its original form or allow you to save the information and use a separate utility to convert the information.

Publishing information with FTP

FTP would not be considered current user-friendly technology, considering the ease of use of programs like Gopher and WWW have greatly reduced dependence on ftp. However, there are still places where a good old fashioned FTP site fits the bill nicely. If a software developer would like to put freeware, shareware, or demo software at a location where people can retrieve it, there are some very popular ftp sites where users go to look for programs. If you have written a paper on a hot topic, there are ftp sites where they can be stored and downloaded by other Internet users. Sometimes, users wishing to retrieve information from an ftp site are scared off by the command line interface. Software applications such as Fetch, TurboGopher, H Gopher, and the Web browsers have helped eliminate the need for the command line interface. Users can navigate through ftp directories using a menuing structure available in both Gopher and WWW browsers.

Anonymous sites. For information that is intended for general Internet availability through ftp the files on placed on a computer somewhere in the world that is running ftp server software. When a user connects to the ftp site, the login name is usually "anonymous" and the password varies from site to site. A common password is your e-mail address but it isn't standard. Depending on the number of files

you intend to publish in this manner, you may choose to set up your own ftp server (more description below). The other option is to find an anonymous ftp site that will accept public input. Many ftp sites have instructions for sending them files located in the top-level directory. A couple of common methods for sending files to ftp sites include sending the file by e-mail and ftp'ing the file to a specified directory for new uploads to a site. Again, this varies from site to site.

When submitting files by e-mail, the ftp site will usually specify whether they choose to have the files submitted with BinHex or UUEncoding. For Macintosh site, BinHex is the most common. For IBM and compatibles, UUEncode is very common. Some sites will even specify a preferred compression program to be used before BinHex or UUEncode. The important thing to remember is that you should be Internet friendly by adding the appropriate suffixes for the compression or encoding programs you use.

Setting up a server. To set up a server, there are a few things to consider. First, is there a direct connection to the Internet. See the section on Grades of Service later in this paper to determine the type of access to the Internet needed. The minimum for maintaining an ftp server would be ISDN access. The minimum setup where the files are stored on a remote machine and an administrator can control what is in the ftp directories would be a Dial-up access to a time sharing machine where you had user control over directories on the remote machine which were allocated to the ftp server software. The second type of arrangement would be rare. If possible, a dedicated access machine is preferable, but it is also the most costly option if you are not located where dedicated access is already available (like many colleges and universities). Many people think that to run an ftp site, the machine must be running UNIX. This is a myth. You can start an ftp site with a Macintosh Plus if you that is what is available.

How can people find resources for ftp? Since there are hundreds of ftp sites on the Internet some public and some with restricted access, a user might wonder if there is a method for finding resources on the Internet. The searching tool for ftp is called Archie. For those who remember Archie and the Gang cartoon at Riverdale High School a theme for Internet search tools is based on the show.

What is Archie. Basically, Archie is a database of all the anonymous ftp sites in the world. With various commands available to Internet users, a user can find where a file is stored and then proceed in retrieving it. A user can log into an Archie site directly or submit a query by e-mail.

Accessing Archie by e-mail. As with most Internet services, they can be accessed if all you have is e-mail. To obtain details on how to use Archie by e-mail, send a message to "archie@archie.sura.net" and enter "help" in the subject field. Leave the rest of the message blank. A message will be sent to the users e-mail account describing how to use the Archie services by e-mail.

Publishing with Gopher

The Internet Gopher probably has the widest accessibility for those with a character based Internet access such as a dial-up VT-100 terminal. Gopher has a hierarchical menu structure. To navigate a gopher once you are connected you only need to select items on a menu and gopher handles all of the dirty work like changing directories and issuing commands to display the list for the current directory. This is a major progression from the command issuing needs of ftp sites for users who really do not want to learn all of the commands. Selecting menu items in Gopher do not always leave you on the same

server. A menu item can be a text file on a local machine or a pointer to a menu, file, or session which resides on another computer anywhere in the world.

Gopher allows users to browse through text files as well as download files. Depending on the site where your gopher service is located, you can usually open other gopher sites directly or you can access a listing of the registered Gopher sites maintained by the University of Minnesota Gopher Team.

As an experiment last February, the ERIC Clearinghouse for Science, Mathematics, and Environmental Education joined others in the ERIC network of clearinghouses in setting up a gopher site. The AskERIC Virtual Library and sister sites in the ERIC system now receive over 20,000 user connections per week! And there were those who thought there wouldn't be any activity since schools didn't have access to the Internet. After over a million transactions through Gopher and WWW, they may have underestimated the interest it would generate.

Formatting of the browsable Gopher file. Very similar to publishing text based information by e-mail. The files should be a plain ASCII file with hard returns at the end of each line. The lines should be 70-75 characters in length. The files should not contain formatting such as tabs, italics, auto-centering, and so forth. For those trained as typist on manual typewriters, this should be no problem. For a title to be centered on the page, press space until it is at the center. Do not use the tab key since some Gopher client programs interpret a tab as a single space while others interpret the tab as 5 spaces. An obvious inconsistency would occur in display.

Placing formatted files and software in Gopherspace. The entire world of gopher servers are connected to each other in one form or another. The collection of servers is often called gopherspace. The process of moving around in gopherspace is sometimes called burrowing. When placing files on a gopher server for people to download, it is important to remember the naming conventions described earlier. Many gopher client programs will interpret UUEncode and BinHex files automatically. However, most do not take off two levels of encoding. For example, if a file named "college-courses.sit.hqx" is downloaded, the gopher program may save a file called "college-courses.sit" on your machine or in your user area. It would be up to you to decode or expand the remaining file. The other alternative for Gopher is defining alternate views.

What are alternate views. When the Gopher team released the Gopher+ protocol there was an option defining views the user could retrieve. For example, you might have an ASCII text version of a file for the user to browse. Then you might also have a formatted version of the file in Microsoft Word and PageMaker formats. These would show up on a Gopher menu as one item. The user would have to select the alternate view list to see if a different version of the file was available.

Getting information from users. Both Gopher and WWW have the ability to request information from users. In Gopher these files are called Ask forms or Electronic forms. Basically, a text file is set up which has embedded codes in them such as ASK, ASKP, CHOOSE, etc. and the client program will interpret the file and display the options native to the computer the user is on. For example, if you enter a choose command it can display on a Macintosh as radio buttons or check boxes. For people who like to have questionnaires filled out or people added to a mailing list, the Ask form technology is available. The method for implementing Ask forms is included with the documentation of the gopher servers.

There are sample Ask forms available at the University of Minnesota site where the server software is available.

Setting up a server. It might be possible to find an arrangement where an administrator of an existing Gopher site agrees to put information on their Gopher site and make it available. Setting up a gopher server, required a direct connection to the Internet. The same minimum configuration as the ftp site mentioned earlier. There is software available to set up and maintain Gopher servers on Macintosh, IBM/Compatibles, as well as UNIX. Software for the servers is available through the University of Minnesota's Gopher site "boombox.micro.umn.edu".

How can people find resources in Gopher? Just like with ftp, there are hundreds of servers on the Internet. The method for searching Gopher takes two forms. A user can search a local Gopher's resources or a macro-search over the entire list of registered Gophers. The search tool for local Gopher's is called Jughead. The search tool for searching all of Gopherspace is called Veronica. Remember the Archie and the Gang theme?

What is Jughead? On UNIX based gopher servers, Jughead allows a word search of the directory and file names stored on that machine. There are no Boolean operators or other complex searching since the total number of files would be relatively small for a single server when compared with the over 4800 registered Gophers.

What is Veronica? Veronica is a search tool that is the Gopher equivalent of Archie for ftp. There are several Veronica sites around the world to aid in finding materials in Gopherspace. They are very heavily loaded, so it may take a few tries before connecting to one of the servers. Sometimes, like Archie, it is easier to send an e-mail message and receive the search results back in your e-mail.

Accessing Gopher by e-mail. Just like ftp, exploration of the exciting world of Gopher is possible through e-mail. To begin, send an e-mail message to "gophermail@calvin.edu" leave the subject field blank and enter a one line message "help" and shortly a message will be received with instructions on using Gopher by e-mail.

Software for Gopher. There are servers and client programs available for a wide variety of platforms including Macintosh, IBM/Compatibles, and UNIX. The nicest thing about these is that most are free. From Gopher, select the gopher name "boombox.micro.umn.edu" and then select the menu item "gopher" and there are machine specific directories to lead to the files needed. There is also a wide variety of documentation there that will further help in getting started with gopher server administration.

Publishing on the World Wide Web

The World Wide Web is considered the wave of the future for distributing information on the Internet. The WWW allows servers to display text, graphics, request input, and play sounds. WWW is "hyper" linked. Gopher allowed people to have menu items as pointers to other resources on the Internet. With the WWW pointers called links can be placed inside a document. The client software that is used to browse the WWW sites usually have links underlined or displayed in some noticeable fashion like a different color. Selecting a link is as simple as pointing and clicking on it. A graphics based machine is not required to view items on the WWW. A program called "lynx" allows a text based access to the

WWW. With lynx, a user is not able to see the graphics or play the sounds, but the user can see the text and access the hyperlinks embedded in the document.

The WWW allows users to browse through text files, access Gopher sites, as well as access ftp sites. One method of looking at these Internet tools is to say that ftp is the father of Gopher which is the father of the WWW. They are a family with a good relationship and the grandson (WWW) can do everything the father can do and it can do everything the grandfather can do too.

Formatting the browsable WWW file. If a file is not taking advantage of the WWW features of formatting and is only displaying as a text file, the formatting is the same as for Gopher. However, the WWW has many advanced features which make the resulting browsable document look much nicer and can be printed on a users local machine with formatting in tact. The structure used to format documents for display on the WWW is a subset of the Standard Generalized Markup Language (SGML). SGML has a feature called Document Type Definitions (DTD). For the WWW a DTD called the HyperText Markup Language (HTML) is used.

Basics of HTML documents. HTML documents are plain ASCII files. Just about every reputable word processor can save in ASCII or text format. So you can create HTML documents with a text editor/word processor of choice. The "ML" part of HTML says it is a markup language. A document to be interpreted as HTML is a series of elements or tags. All elements are enclosed in <>'s and they usually come in pairs (i.e. <TITLE>...</TITLE>). The elements tell WWW browsers such as NCSA Mosaic or Netscape's how to display the document using the preferences set up by the user.

When interpreting HTML documents, extra spaces and carriage returns do not have an effect on the appearance of the final document. For example:

Isn't HTML coding fun?
I think so.<p>

would be interpreted as one paragraph. The <p> element tag signifies the end of a paragraph and is the major exception to the pairing rule mentioned earlier.

Understanding tags is key to successful HTML coding. The first tag is called a directive. The ending tag looks exactly like the beginning tag except there is a / preceding the tag-word. Tag-words are not case sensitive. So entering <TITLE> is the same as entering <title> or <TiTle>. Tags are also used to create links to other documents, locations within the current document, images, sounds, and other resources as they become available. Links to other locations requires knowledge of uniform resource locators below.

A new thrust of the Internet community is developing a new standard for HTML documents called HTML+. There are new tags for additional document formatting such as centering paragraphs which were not covered in the original HTML specification. A document covering the methods for creating HTML documents can be found in its current version at the following URL:
"http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html".

Basics of URLs. URLs are the heart of linking information in the WWW as well as the rest of the Internet. Resources were being placed on the Internet at various sites and different tools were required to locate them. A method was needed for describing where something was and what tools were needed

to locate them. A metaphor used to describe URLs are to the Internet what filenames are to a local machine. The most common URLs point to files, Gopher sites, newsgroups, and WWW resources.

Currently, all URLs except newsgroups follow a common syntax. The name of the resource type, followed by a colon and two slashes and the location of the resource followed by a colon and a port number. Usually, the port number can be eliminated since there are standards for what ports to use. About the only time it is used is when the resources isn't on the standard port. Here are a few examples:

file://www.ncsa.uiuc.edu/demoweb/url-primer
gopher://gopher.ericse.ohio-state.edu
http://www.eryx.syr.edu
news:comp.sys.apple2

When a user wants to connect a WWW browser to a URL they must define it. WWW specific resources begin with http://. The http stands for HyperText Transport Protocol. When accessing network news, your news server has to be defined. The news server is different depending on the site where a user's Internet account is provided or purchased. Contact the network administrator for the name of the location where network news can be retrieved.

Getting information from users. The WWW method for requesting and retrieving information from users are also called forms. Forms utilize a series of HTML tags to let WWW browsers know what types of information to display to the user. The WWW browsers are still implementing capabilities for forms. For example, many Gopher forms are not compatible with WWW browsers. Eventually these will all work with the WWW browsers. For a file on creating WWW forms, connect to this URL: "http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/Docs/fill-out-forms/overview.html" which has examples and tags used for creating forms. Collecting information for performing local searches, research questionnaires, and more are all possibilities with fill out forms on the WWW.

Setting up your own server. There are services springing up in the Internet community that will provide space on WWW servers for public information. HTML code can be tested without a connection to the Internet. NCSA's Mosaic as well as other browsers have a command called Open Local or Open File that load an interpret HTML code. Creating HTML files may reduce costs of having information placed on one of these sites. However, some sites may even develop HTML code for a price. The prices for doing this will vary between sites. As the popularity of the WWW increases, more and more services like this will become available.

Server software for the Macintosh line of computers can be found at the following URL: "http://www.ncsa.uiuc.edu/SDG/Software/MacMosaic/RelatedApps.html" and you can find servers for UNIX machines at "http://www.ncsa.uiuc.edu/SDG/Software/XMosaic/faq-software.html#servers".

Accessing WWW by e-mail. With all of the multimedia capabilities of the WWW, accessing resources by e-mail is somewhat limited. It can be done. To receive a WWW page by e-mail, send a message to "listproc@www0.cern.ch" leave the subject field blank and enter in the body of the document "www <URL>" replacing "<URL>" with the URL you would like to see. The document will be sent back and the URLs referenced in the document will be listed at the end of the message.

Software for WWW. Graphical User Interface (GUI) clients are available for many platforms. You can also access the WWW with a VT-100 interface by telneting to one of the public WWW login sites. Again, when using the VT-100 clients or lynx client, the user cannot see the graphics, but can read the text associated with the documents. The net-tools document mentioned earlier has a listing of publicly available sites for obtaining WWW browser software.

GRADES OF INTERNET SERVICE

Internet access comes in various forms. For some it comes from a dial-up bulletin board which may offer access to the Internet by e-mail only. Others may have a dedicated access machine on their desktop. The highest level of access is dedicated Internet access. Each machine connected to a dedicated machine (usually by an Ethernet network) is a full Internet member and has its own IP address. SLIP and Point to Point Protocol (PPP) access is almost like dedicated access in which you use a standard telephone line, a relatively fast modem, and dial into a networked computer. Integrated Services Digital Network (ISDN) lines are only supported in some areas. ISDN provides access like SLIP but the line is dedicated for Internet use. The typical ISDN includes two digital channels which operate at high speeds like 56Kb per second and cost around 20-50 dollars per month. Related to ISDN lines are T1 lines which are about two times as fast and a popular option for schools. Finally, access to the Internet may be through a time sharing account. Time sharing accounts are easy to set up, but your computer does not actually become part of the Internet like the other grades of service. If a connection to the Internet is not already in place, a service provider will need to be located. More providers are sprouting around the country. To receive a list of providers send e-mail to "info-deli-server@netcom.com" leave the subject field blank and enter a one line message send PDIAL and shortly the list will be e-mailed back.

ADDITIONAL REFERENCES AND RESOURCES

1. E. Krol, The Whole Internet User's Guide & Catalog, O'Reilly & Assoc., Sebastopol, CA.

2. P. Gilster, The Internet Navigator, John Wiley & Sons, Inc., New York.

3. B. L. Kurshan, M. A. Harrington, P. G. Milbury, An Educator's Guide To Electronic Networking: Creating Virtual Communities, ERIC Clearinghouse on Information & Technology, Syracuse, NY.

Table 1. Suffixes used for converter and compression programs.

Program Type	Program Name	Suffix used
Converter	BinHex	hqx
	UUEncode UUDecode	uu
Compression	Stuffit™	sit
	Compact Pro	cpt
	Arc	arc
	PKZip	zip
	Compress	Z
	Shell Archive	shar
	Tape Archive	tar